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| 09/775,695 | 02/02/2001 | Shuzo Kato | 252/007 | 9006 |

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| EXAMINER | |
|---|---|
| MOLINARI, MICHAEL J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2665 | 7 |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/775,695 | KATO ET AL. | |
| | Examiner | Art Unit | |
| | Michael J Molinari | 2665 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 October 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 May 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the sampler, the correlator, the comparator, the sample bins, the receiver, and the demodulator must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3 and 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kingston et al. (U.S. Patent Application Publication No. US 2001/0007573) in view of Brardjanian et al. (U.S. Patent No. 6,567,480).

5. Referring to claim 1, Kingston et al. disclose a time slot synchronizer, comprising: a sampler configured to: successively a plurality of symbols (see paragraph 0037); divide each symbol into a plurality of sample bins (Weights, see Figure 4, #16); generate a first sample group from a first frame by sampling each symbol in the first frame in a first and second sample bin; and generate a second sample group from a second frame by sampling each symbol in the second frame in a third and fourth sample bin, the third and fourth sample bins being shifted a certain number of sample bins relative to the first and second sample bins, respectively (see paragraphs 0040, 0044 and 0045), a correlator configured to correlate the first and second groups of samples with a stored sync word (PN Code, see paragraph 0045) in order to generate a final correlation estimate (see Figure 3A, #14), and a comparator configured to compare the final correlation estimate to a correlation threshold (Squelch Block, see paragraph 0042). Kingston et al. differ from claim 1 in that they fail to disclose sampling a baseband signal comprising a plurality of frames. However, it is well known in TDMA synchronization to sample a baseband signal comprising a plurality of frames. For example, Brardjanian et al. disclose sampling a baseband signal (see column 3, lines 41-56) comprising a plurality of frames (see column 2, lines 12-29), which has the advantage of being the standard method of performing TDMA communications. One skilled in the art would have recognized the advantage of sampling a baseband signal comprising a plurality of frames as taught by Brardjanian et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the

sampling of a baseband signal comprising a plurality of frames as taught by Brardjanian et al. into the invention of Kingston et al. to achieve the advantage of practicing the invention according to the standard principles of TDMA communication.

6. Referring to claim 2, Kingston et al. disclose that the total number of sample bins is eight (see paragraph 0053).

7. Referring to claim 3, Kingston et al. disclose that the third and fourth sample bins are shifted two sample bins relative to the first and second sample bins, respectively (see Figure 4).

8. Referring to claim 5, Brardjanian et al. disclose that each frame is divided into a plurality of time slots, there being a sync word at the beginning of each time slot, and wherein correlation with the stored sync word only occurs for the samples generated from the sync words at the beginning of each time slot (see column 2, lines 12-29).

9. Referring to claim 6, Brardjanian et al. disclose that each sync word comprises 14 symbols (see column 2, lines 12-29).

10. Referring to claim 7, Brardjanian et al. disclose that each frame comprises six time slots (see column 2, lines 12-29).

11. Referring to claim 8, Kingston et al. disclose that the sampler is configured to generate a first sample group series from a first plurality of frames that includes the first frame by sampling each frame in the first plurality of frames using the first and second sample bins, and wherein the correlator is configured to generate a first correlation estimate comprising the average correlation estimate for each frame in the first plurality of frames, and wherein the comparator is configured to use the first correlation estimate to generate the final correlation estimate (see paragraphs 0044 and 0045).

12. Referring to claim 9, Kingston et al. disclose that the sampler is configured to generate a second sample group series from a second plurality of frames that includes the second frame by sampling each frame in the second plurality of frames using the third and fourth sample bins, and wherein the correlator is configured to generate a second correlation estimate comprising the average correlation estimate for each frame in the second plurality of frames, and wherein the comparator is configured to use the second correlation estimate to generate the final correlation estimate (see paragraphs 0044 and 0045).

13. Referring to claim 10, Kingston et al. disclose a mobile station comprising: a receiver for receiving a signal (see paragraph 0004); a demodulator (see Figure 1B, #12) coupled to the receiver, the demodulator configured to take the signal and to generate a signal comprising a plurality of symbols (see paragraph 0037); and a sampler configured to successively sample the baseband signal by: dividing each symbol into a plurality of sample bins; generating a first sample group from a first frame by sampling each symbol in the first frame in a first and second sample bin; and generating a second sample group from a second frame by sampling each symbol in the second frame in a third and fourth sample bin, the third and fourth sample bins being shifted a certain number of sample bins relative to the first and second sample bins, respectively (see paragraphs 0040, 0044, and 0045), a correlator configured to correlate the first and second groups of samples with a stored sync word (PN Code, see paragraph 0045) in order to generate a final correlation estimate (see Figure 3A, #14), and a comparator for comparing the final correlation estimate to a correlation threshold (Squelch Block, see paragraph 0042). Kingston et al. differ from claim 10 in that they fail to disclose sampling a baseband signal comprising a plurality of frames. However, it is well known in TDMA synchronization to

sample a baseband signal comprising a plurality of frames. For example, Brardjanian et al. disclose sampling a baseband signal (see column 3, lines 41-56) comprising a plurality of frames (see column 2, lines 12-29), which has the advantage of being the standard method of performing TDMA communications. One skilled in the art would have recognized the advantage of sampling a baseband signal comprising a plurality of frames as taught by Brardjanian et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the sampling of a baseband signal comprising a plurality of frames as taught by Brardjanian et al. into the invention of Kingston et al. to achieve the advantage of practicing the invention according to the standard principles of TDMA communication.

14. Referring to claim 11, Brardjanian et al. disclose that each frame is divided into a plurality of time slots, there being a sync word at the beginning of each time slot, and wherein correlation with the stored sync word only occurs for the samples generated from the sync words at the beginning of each time slot (see column 2, lines 12-29).

15. Referring to claim 12, Kingston et al. disclose that the sampler is configured to generate a first sample group series from a first plurality of frames that includes the first frame by sampling each frame in the first plurality of frames using the first and second sample bins, and wherein the correlator is configured to generate a first correlation estimate comprising the average correlation estimate for each frame in the first plurality of frames, and wherein the comparator is configured to use the first correlation estimate to generate the final correlation estimate (see paragraphs 0044 and 0045).

16. Referring to claim 13, Kingston et al. disclose that the sampler is configured to generate a second sample group series from a second plurality of frames that includes the second frame by

sampling each frame in the second plurality of frames using the third and fourth sample bins, and wherein the correlator is configured to generate a second correlation estimate comprising the average correlation estimate for each frame in the second plurality of frames, and wherein the comparator is configured to use the second correlation estimate to generate the final correlation estimate (see paragraphs 0044 and 0045).

17. Referring to claim 14, Kingston et al. disclose that the receiver is configured to look for a different signal when the correlation estimate does not exceed the correlation threshold (see paragraphs 0078-0082).

18. Referring to claim 15, Kingston et al. disclose a method for time slot synchronization using a sampler configured to successively sample a signal comprising a plurality of symbols (see paragraph 0037), the method comprising: dividing each symbol into a plurality of sample bins (Weights, see Figure 4, #16); generating a first sample group from a first frame by sampling each symbol in the first frame in a first and second sample bin; generating a second sample group from a second frame by sampling each symbol in the second frame in a third and fourth sample bin, the third and fourth sample bins being shifted a certain number of sample bins relative to the first and second sample bins, respectively (see paragraphs 0040, 0044, and 0045); correlating the first and second groups of samples with a stored sync word (see PN Code, see paragraph 0045) in order to generate a final correlation estimate (see Figure 3A, #14); and comparing the correlation estimate to a final correlation threshold (Squelch Block, see paragraph 0042). Kingston et al. differ from claim 15 in that they fail to disclose sampling a baseband signal comprising a plurality of frames. However, it is well known in TDMA synchronization to sample a baseband signal comprising a plurality of frames. For example, Brardjanian et al.

disclose sampling a baseband signal (see column 3, lines 41-56) comprising a plurality of frames (see column 2, lines 12-29), which has the advantage of being the standard method of performing TDMA communications. One skilled in the art would have recognized the advantage of sampling a baseband signal comprising a plurality of frames as taught by Brardjanian et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the sampling of a baseband signal comprising a plurality of frames as taught by Brardjanian et al. into the invention of Kingston et al. to achieve the advantage of practicing the invention according to the standard principles of TDMA communication.

19. Referring to claim 16, Brardjanian et al. disclose that each frame is divided into a plurality of time slots, there being a sync word at the beginning of each time slot, and wherein correlation with the stored sync word only occurs for the samples generated from the sync words at the beginning of each time slot (see column 2, lines 12-29).

20. Referring to claim 17, Kingston et al. disclose generating a first sample group series from a first plurality of frames that includes the first frame by sampling each frame in the first plurality of frames using the first and second sample bins; generating a first correlation estimate comprising the average correlation estimate for each frame in the first plurality of frames; and using the first correlation estimate to generate the final correlation estimate (see paragraphs 0044 and 0045).

21. Referring to claim 18, Kingston et al. disclose generating a second sample group series from a second plurality of frames that includes the second frame by sampling each frame in the second plurality of frames using the third and fourth sample bins; generating a second correlation estimate comprising the average correlation estimate for each frame in the second plurality of

frames; and using the second correlation estimate to generate the final correlation estimate (see paragraphs 0044 and 0045).

22. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kingston et al. in view of Brardjanian et al. as applied to claim 1 above, and further in view of Lee (U.S. Patent No. 5,243,598).

23. Referring to claim 4, Kingston et al. in view of Brardjanian et al. differ from claim 4 in that they fail to disclose that each frame comprises 486 symbols. However, the use of frames comprising 486 symbols in TDMA is old and well known in the art. For example, Lee teaches the use of a TDMA frame comprising 486 symbols (see column 11, lines 22-27), which has the advantage of being a conventional TDMA frame. One skilled in the art would have recognized the advantage of a 486 symbol frame as taught by Lee. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the use of a TDMA frame comprising 486 symbols as taught by Lee into the invention of Kingston et al. in view of Brardjanian et al. to achieve the advantage of using a standard TDMA frame structure.

***Conclusion***

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

25. U.S. Patent No. 5,537,435 to Carney et al. teaches a synchronization circuit for a TDMA mobile station that performs parallel correlation with a single peak detector.

26. U.S. Patent No. 5,680,421 to Shiino et al. teaches a serial method of performing synchronization in a TDMA mobile station.

27. U.S. Patent No. 5,659,573 to Bruckert et al. teaches a method of performing synchronization in a TDMA mobile station using oversampling.

28. U.S. Patent No. 5,699,389 to Beladi et al. teaches a method of performing synchronization in a TDMA mobile station using oversampling and parallel correlators and comparators.

29. U.S. Patent No. 4,587,662 to Langewellpott teaches a method of performing TDMA spread-spectrum synchronization using parallel correlators.

30. U.S. Patent No. 5,590,160 to Ostman teaches a method of performing synchronization for both TDMA and CDMA mobile stations.

31. U.S. Patent No. 5,237,586 to Bottomley teaches a method of performing acquisition in a CDMA mobile station using parallel samplers and correlators.

32. U.S. Patent No. 6,625,200 to Dent teaches CDMA frame structure.

33. U.S. Patent Application Publication US 2002/0080735 to Heath et al. teaches frame structure in a CDMA communication system.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Molinari whose telephone number is (703) 305-5742. The examiner can normally be reached on Monday-Thursday 8am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJM

Michael Joseph Molinari

DUC HO
PRIMARY EXAMINER

6-8-04

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